
ENVIRONMENTAL Fact Sheet



29 Hazen Drive, Concord, New Hampshire 03301 • (603) 271-3503 • www.des.nh.gov

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Combined Sewer Overflows (CSOs)

What are Combined Sewers and a Combined Sewer Overflow?

Combined sewers are pipes that collect both stormwater and municipal wastewater or sewage. Stormwater may enter the combined sewer system through catch basins installed in streets to alleviate flooding when it rains. Combined sewers are different from separated sewers, which are pipes that collect and convey only wastewater from businesses and residences.

During dry weather, combined sewers convey only wastewater to the municipal wastewater treatment facility (WWTF) where it is treated before being discharged to a water body, such as a river or a stream. When it rains heavily, however, large amounts of stormwater may enter the combined sewer and rapidly fill the pipes. If the capacity of the combined sewer or the WWTF is exceeded, the combined sewer overflows. These wet weather discharges of untreated wastewater and stormwater are called combined sewer overflows (CSO).

Why are CSOs a concern?

Depending on factors such as the volume and frequency of overflow, the location of the CSO, the concentration of pollutants in the CSO, and the characteristics of the receiving water, CSOs are a potential source of water pollution as they discharge a combination of untreated domestic sewage, industrial wastewater, and stormwater. Because of this, they may pose a risk to public health, stress the aquatic environment and/or impact water uses such as swimming, fishing or shell fishing. Specifically, pollutants that are typically present in CSOs include the following:

- Bacteria from human and animal fecal matter, which could cause illness.
- Oxygen demanding pollutants that may deplete the concentration of dissolved oxygen in the receiving water to levels that may be harmful to aquatic life.
- Suspended solids that may increase turbidity or damage benthic communities.
- Nutrients that may cause eutrophication.
- Toxics that may persist, bioaccumulate, or stress the aquatic environment.
- Floatable litter that may either harm aquatic wildlife or become a health and aesthetic nuisance to swimmers and boaters.

How has New Hampshire addressed the CSO problem?

To address the CSO problem in New Hampshire, the Department of Environmental Services (DES) developed a CSO Control Strategy in 1989. This strategy consists of a two-step process. The first step is to determine the volume and strength of CSO discharges and their impact on the water quality of the receiving waters. Where it is determined that CSOs violate New Hampshire's

Surface Water Quality Regulations (N.H. Administrative Rules, Env-Ws 1700), the community must then develop a comprehensive CSO Facility Plan to determine the most cost-effective solution to abate CSO pollution.

How much will it cost New Hampshire communities to abate CSO pollution?

Nationwide, the cost to abate CSO pollution has been estimated to cost tens of billions of dollars and may run into the hundreds of millions of dollars in New Hampshire. As there is no longer a federal grant program to fund water pollution abatement projects, the financial impact to communities with CSOs is potentially significant.

Which New Hampshire communities have CSOs and what are they doing to abate their pollution?

A total of 47 CSOs have been identified in the communities of Portsmouth, Manchester, Nashua, Lebanon, Berlin, and Exeter. The following is a brief status report on the efforts underway in each community to control CSOs.

Portsmouth - Although the City of Portsmouth has eliminated seven CSOs, it still has at least three remaining. The City's 201 Facilities Plan Update, which was completed in November 1999, discussed the remaining CSOs as well as other potential areas in the City which may contain "cross connections" between the sanitary and storm sewer systems. To address these items and determine the most cost-effective manner of complying with the state's water quality standards, the City updated its CSO Long Term Control Plan (LTCP) and submitted it to EPA and DES in August 2002. The LTCP is presently being reviewed and, when approved by DES and EPA, will likely result in modifications to the City's existing consent agreement.

Manchester - In May 1995, the City of Manchester completed its Long Term Control Plan (LTCP) for CSOs. It concluded that approximately 220 million gallons of untreated combined sewer overflow is discharged to the Merrimack and Piscataquog Rivers each year by 26 CSOs.

In 1999, the City began implementing Phase I of its CSO Facility Plan that will take approximately 10 years to complete. Once completed, Phase I will eliminate 13 CSOs by sewer separation, including all those along the Piscataquog River, and will reduce the volume of overflows at another six CSOs by modifying CSO regulators and increasing the amount of flow through the WWTF during wet weather. As part of Phase I, the City will also develop a control program for the remaining CSOs. In exchange for a phased approach, the City also agreed to spend approximately \$5.6 million by 2004 on several Supplemental Environmental Projects (SEPs), the major ones being the preservation of the atlantic white/giant rhododendron/black gum ecosystem in Hackett Hill, development of a comprehensive plan to control stormwater, and stream bank stabilization and erosion control along the Merrimack River and its tributaries. In total, Phase I will reduce the average annual CSO volume from approximately 220 to 73 million gallons per year and is estimated to cost approximately \$63.6 million.

Nashua - In 1992, the City of Nashua completed a study of CSOs at a cost of approximately \$373,000. The study concluded that the Nashua CSOs impacted existing water quality standards and receiving water uses. Accordingly, the City undertook and completed additional work to prepare a CSO abatement program report. This report was completed in September 1997 and resulted in EPA issuing an Administrative Order (AO) requiring the City to eliminate their nine CSOs by separating their combined sewer system by the year 2019. Subsequent to this AO, the City hired a consultant to re-assess whether or not a complete separation was the best alternative. After a review and approval of the consultant's report, EPA issued another AO, replacing the

existing one and is in the process of issuing a Consent Decree incorporating the consultant's recommendations.

The City has recently begun the design and construction of combined sewer separation projects to separate all sources of stormwater flow into its collection system. Further, the City is revising its High Flow Management Plan in an effort to maximize the flow to the wastewater treatment facility during wet weather events. It is expected that all of the CSOs will be eliminated by the year 2019 at an estimated cost of \$100 million.

Lebanon - The City of Lebanon has completed its Long-Term Combined Sewer Overflows Control and Abatement Plan (LTCP). The LTCP characterized the combined sewer system and all seven CSO discharges, evaluated a range of abatement alternatives, and recommended the implementation of technology-based and water quality-based controls to protect designated uses of the receiving waters and compliance with water quality standards.

The City will eliminate six of its CSOs by 2008 by separating the sources of stormwater inflow to the sewer system. Further, the City will submit a report by December 31, 2005 to EPA and DES that will detail the steps needed to separate the stormwater sources from the remaining outfall. It is expected that these separation projects will be completed by December 31, 2012. Total cost for the separation is estimated to be approximately \$8.4 million.

Berlin - The City of Berlin completed an extensive sewer separation project in the early 1990s. However it still has one CSO remaining. It is located at the main pump station which, pumps wastewater to the City's wastewater treatment facility. Although it is technically a CSO, it functions as an emergency relief. That is, whenever storm flows exceed the capacity of the pumps, the excess wastewater/stormwater overflows to the Androscoggin River. The City is presently proceeding to eliminate infiltration/inflow in this section of the sewer system in an attempt to eliminate this CSO.

Exeter - The Town of Exeter has been working toward eliminating CSOs from its wastewater collection system for the past 15 years through extensive sewer separation projects. Although most of Exeter's sewer system has been separated, overflows still occur due to excessive system surcharging during wet-weather flows. To address this, the Town conducted a CSO study that was completed in March 1998. This study recommended, among other things, sewer separation to eliminate the CSO discharges to Clemson Pond, an artificially created body of water, which flows to the Squamscott River. The Town has continued its separation projects and expects to eliminate the CSOs within the next few years, at an estimated cost of approximately \$3.5 million.

Does the State offer any financial assistance in the form of grants to CSO communities?

In July 1993, 20 percent state funding became available for municipal wastewater treatment projects for the control of water pollution. Funding may be provided for eligible costs associated with the construction of sewage treatment plants, pumping stations, interceptor sewers, and sewer separation by storm drains when it can be demonstrated that separation is a cost-effective method of eliminating a CSO.

In addition to this funding, the Department of Environmental Services is also authorized, with Governor and Council approval, to pay an additional 10 percent of any sewage disposal project's eligible annual amortization charges, if the project construction cost results in user fees that exceed the statewide average for residential users by 20 percent or more. Communities may therefore receive State assistance of up to 30 percent of the eligible costs to abate CSOs, if the project significantly impacts user fees.

Does the State offer any other type of financial assistance to CSO communities?

The New Hampshire State Revolving Loan Fund (SRF) program can provide 100 percent financing of publicly owned wastewater treatment projects that includes the planning, design, and construction of CSO facilities. The SRF program offers many advantages to communities. Loan interest rates, for example, are established at the time of the initial loan agreement and may be adjusted downward at the beginning of the loan repayment phase. The SRF rules allow more flexibility in structuring loan repayments, with communities now having the option of selecting an interest rate based on the term of repayment. Repayment does not begin until one year after the project has been completed.

For more information, contact the DES Water Division, Wastewater Engineering Bureau at (603) 271-3503.